

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A developing unit of a liquid electrophotographic image forming apparatus, the developing unit comprising:

 a developing roller adapted to supply ink to a photosensitive medium on which an electrostatic latent image is formed, to develop the electrostatic latent image;

 an ink storage unit adapted to store ink to be supplied to the developing roller; and

 an ink cartridge adapted to be installed in the ink storage unit, and to be opened or closed and to supply ink to the ink storage unit;

 wherein the ink cartridge comprises a cartridge sleeve rotatably installed, and a cartridge slider, which slides by rotation of the cartridge sleeve to open the ink cartridge[.]; and

an ink sealing member provided on a surface where the cartridge sleeve contacts the cartridge slider that prevents leakage of ink when the ink cartridge is closed.

2. (original) The developing unit of claim 1, wherein a rotation shaft is provided in the cartridge sleeve, a first screw portion being formed on an end of the rotation shaft, and a second screw portion corresponding to the first screw portion is formed at one side of the cartridge slider so that the cartridge slider slides by rotation of the rotation shaft.

3. (original) The developing unit of claim 1, wherein an elastic member is installed between the cartridge slider and a developing container and applies an elastic force so that the cartridge slider is pushed toward the cartridge sleeve.

4. (currently amended) The developing unit of claim 3, wherein at least one cartridge coupling is formed at one side of the cartridge slider in which a ~~second~~ screw portion is formed, and a guide coupling in which a coupling groove into which the cartridge coupling is inserted, is provided between the cartridge slider and the elastic member.

5. (original) The developing unit of claim 1, wherein a rotation groove is formed on an outer circumference of the cartridge sleeve, and a jaw corresponding to the rotation groove is formed in a developing container that forms outer walls of the developing unit.

6. (original) The developing unit of claim 1, wherein a knob unit is provided on an end of the cartridge sleeve protruding from an outside of a developing container so that the cartridge sleeve is adapted to be rotated from the outside of the developing container.

7. (canceled)

8. (original) The developing unit of claim 1, wherein a concentration of ink is more than about 3% solid.

9. (original) The developing unit of claim 1, wherein a concentration of ink is from about 10 to about 20% solid.

10. (original) The developing unit of claim 1, wherein an inclined angle at insides of the cartridge sleeve and the cartridge slider is greater than about 7 degrees.

REMARKS/ARGUMENTS

Reconsideration and allowance of the above-identified application are respectfully requested. Upon entry of this Amendment, claims 1-6 and 8-10 will be pending.

The Examiner's arguments have been carefully considered. Applicant has amended claim 1 to more clearly define applicant's invention.

The Examiner has objected to claim 4 as reciting "a second screw portion". Applicant has amended claim 4 to overcome the Examiner's objection. Claim 4 now recited "a screw portion." The objection is believed to be overcome. If the Examiner has any questions, she is invited to contact the undersigned attorney at the phone number provided to discuss this matter further.

Turning to the substantive portion of the office action, it is noted with appreciation that claims 2-5 and 10 are allowable, but dependent from a rejected base claim. The Examiner has rejected claims 1, 6 and 7 under 35 U.S.C. §103(a) as unpatentable over U.S. patent number 6,398,849 to Smith et al. in view of U.S. patent number 6,128,453 to Ban et al. More specifically, the Examiner cites Smith as disclosing a toner cartridge with a housing and end cap that allegedly reads on the current invention's "cartridge sleeve". A slide with openings 32 moves to align with openings 18, to go from a covered (closed) position to an exposed (open) position so that toner can freely pass from the interior of the cavity 20 into the reservoir area of the printing apparatus. The Examiner cites Ban as teaching a developing roller.

Applicants have amended claim 1 to more clearly define the present invention. More specifically, claim 1 now recites "an ink sealing member provided on a surface

where the cartridge sleeve contacts the cartridge slider that prevents leakage of ink when the ink cartridge is closed.” None of the cited references teach this feature.

The Examiner rejected claim 7, which previously recited “an ink sealing ring”. However, the “foam seal” taught by Smith does not teach this limitation. The ink sealing member of amended claim 1 is provided on a surface where the cartridge sleeve contacts the cartridge slider, as shown, for example, in FIGS 3A and 3B (159). Smith teaches a cartridge for providing powdered toner to a printing apparatus and therefore leakage is not a critical problem to be overcome. The slide 30 has numerous openings 32 which, when aligned with corresponding openings 18 in the housing, allow toner to exit the cartridge. Such a device, without a sealing member *where the cartridge sleeve contacts the cartridge slider* would not be suitable for use with liquid ink. Furthermore, the multiple openings 32, 18 would require a complicated sealing structure which is not taught, and not necessary for simply powder toner applications.

The cartridge sleeve and slider arrangement of the present invention is advantageous for use with a liquid ink. However, the sealing member is required where the sleeve contacts the slider to prevent ink leakage. The “seal” 48 cited by the Examiner is not located where the sleeve contacts the slider, but rather, at best, is located where the end cap contacts the housing.

Because neither Smith nor Ban teach a developing unit having an ink sealing member *provided on a surface where the cartridge sleeve contacts the cartridge slider* that prevents leakage of ink when the ink cartridge is closed, applicants request that the rejection be withdrawn. Claim 6 depends from claim 1 and therefore claim 6 should be allowed for the same reasons. Claim 7 has been canceled by the amendment.

Claims 8 and 9 were rejected under 35 U.S.C. §103(a) as being upatentable over Smith and Ban in further view of U.S. Published Patent Application No. 2002/0150829 to Zhao et al. Zhao is cited for teaching developing with a liquid developer to create a marking material layer having a solids percentage by weight in the range between 15 percent and 35 percent. Without admitting what is actually taught by Zhao, Applicants note that Zhao does not make up for the deficiencies discussed above with respect to Smith and Ban. In particular, Zhao does not teach an ink sealing member provided on a surface where the cartridge sleeve contacts the cartridge slider that prevents leakage of ink when the ink cartridge is closed. Accordingly, claims 8 and 9 should be allowed.

Claims 2-5 and 10 were allowable but rejected as being dependent on a rejected base claim. Applicants believe that claim 1 is now allowable, and accordingly, claims 2-5 and 10 should also be allowed.

In view of the above, it is believed that the application is in condition for allowance and notice to this effect is respectfully requested. Should the Examiner have any questions, the Examiner is invited to contact the undersigned at the telephone number indicated below.

Respectfully Submitted,



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